The Listing of Claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

Claim 1. (Currently Amended)   A method of controlling exposure time in an x-ray apparatus, ~~for imaging an object,~~ the apparatus comprising an x-ray source and a displaceable detector [[being]] arranged to move with a controllable speed across an image exposure area, said detector having a first and a second edge, said first edge being [[in]] adjacent to a movement direction of said detector, the method comprising the steps of:

[[a.]] (i) setting a target signal [[(400)]], calculated to obtain a pre-defined signal to noise ratio (SNR),

[[b.]] (ii) setting a detector Region Of Interest (ROI) [[(401)]], comprising a sensor in ~~(151) on~~ said first edge,

~~c. setting a start velocity (402),~~

[[d.]] (iii) start scanning [[(403)]],

[[e.]] (iv) collecting a signal from said ROI [[(404)]],

[[f.]] (v) compensating the signal with respect to at least one of ROI size and efficiency [[(405)]],

[[g.]] (vi) comparing the signal with a target signal (S_{target}) and calculating a new optimal velocity [[(406)]], and

[[h.]] (vii) setting a new velocity during said scanning.

Claim 2.   (Original)   The method of claim 1, wherein the target value is calculated from object thickness and spectrum incident on the object.

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Claim 3.   (Original)   The method of claim 1, wherein the signal is acquired from a discrete number of regions on said detector.

Claim 4.   (Original)   The method of claim 1, wherein the detector is a photon-counting detector and the signal is the counted number of photons.

Claim 5. (Currently Amended) The method of claim 1, wherein a distance the detector moves between readouts defines pixels in the scan direction[[,]] as a first dimension, and in a second dimension, the detector comprises actual pixels.

Claim 6.   (Currently Amended)   The method of claim 1, wherein the detector functions as a part of an exposure control system and as well as an image receptor.

Claim 7. (Currently Amended) The method of claim 1, wherein based on a [[the]] number of photons collected in a predefined region of the detector, the scan velocity is alternated modified .

Claim 8. (Currently Amended) The method of claim 7, further comprising changing scan-speed with respect to a count rate change in said region for controlling the number of counts reached per a first dimension pixel.

Claim 9. (Currently Amended) The method of claim 7, comprising a feed-back from [[the]] said displaceable detector based on the count rate in said region.

Claim 10.   (Currently Amended)   The method of claim 9, wherein said feedback is substantially real-time and controls the scan speed of the detector.

Claim 11. (Currently Amended) The method of claim 10, wherein the exposure of each point along an x-axis is controlled based on the count rate of [[the]] said region and thus the entire image has a controllable signal level along the first dimension at least in said region in the second dimension.

Claim 12. (Currently Amended) The method of claim 9, further comprising the step of minimizing total scan time by areas not covered by dense objects being scanned with increased speed faster and thus exposed shorter.

Claim 13. (Original) The method of claim 1, wherein said detector itself is used to control the exposure.

Claim 14. (Currently Amended) The method of claim 1[[5]], wherein said step (iv) [[e]] comprises reading a number of counted photons or SNR.

Claim 15. (Currently Amended) The method of claim 1[[5]], wherein said x-ray apparatus is a photon counting device and [[the]] a new velocity (V_{new}) is calculated as $V_{new} = V_{old} \times S_{target} / S_{measured}$, wherein V_{old} is the old velocity, S_{target} is the target velocity and $S_{measured}$ is a measured signal.

Claim 16. (Currently Amended) The method of claim 1, wherein in said step (vi) [[g]], if target signal is higher than measured signal, (406') then the velocity is decreased (4061') otherwise old velocity is maintained kept (4062').

Claim 17. (Currently Amended) The method of claim 1, wherein said step (vi) [[g]] includes requiring new velocity to be at least higher than a preset minimum velocity.

Claim 18. (Currently Amended) The method of claim 1, wherein depending on detector size the velocity decreases (4061"), if the target signal is

higher than the measured signal (406") otherwise the velocity is increased
(4062") .

Claim 19.   (Currently Amended)   The method of claim 1, comprising the
alternative step [[g]] (vi) of:

> (a) collecting a compression height (h_{compression}) data,
> projection and data about an examination type (4062") ,

> (b) collecting from previous examinations (4063") .
> based on previous step, typical examination object density profile,

> (c) calculating (4064") an optimal velocity profile
> based on estimation of said density profile and measured
> signals, and

> (d) calculating new velocity based on the above data
> from steps a – c.

Claim 20. (Currently Amended) The method of claim 1, wherein said step
of setting choosing the ROI includes:

  [[-]] (a) deciding an scan direction,

  [[-]] (b) choosing an ROI that will enter the object first, and

  [[-]] (c) checking that said ROI has a sufficient number of
  operative detector elements working else choosing next appro-
  priate ROI.

Claim 21. (Currently Amended) An arrangement for controlling exposure
time mountable in an x-ray apparatus, comprising (100), which comprises an
x-ray source [[(110)]] and a displaceable detector (150), being arranged to be

displaced with a controllable speed across an image exposure area, <u>and</u> ~~characterised in that~~ said detector ~~comprises~~ <u>having</u> a first edge arranged as leading edge in a displacement direction<u>, said detector further comprising a Region of Interest (ROI) comprising a sensor in said first edge</u>, the arrangement ~~further~~ comprising <u>arrangement</u> [[means]] for setting a target signal [[(400)]], calculated to obtain a pre-defined signal to noise ratio (SNR), ~~said detector having a Region Of Interest (ROI) (401) comprising a sensor in said first edge, means~~ for obtaining a start velocity ~~(402), means~~ <u>arrangement</u> for collecting a signal from said ROI ~~(404), means~~ <u>arrangement</u> for compensating the signal with respect to at least one of ROI size and efficiency ~~(405), compression means~~ <u>comparing arrangement</u> for comparing the signal with a target signal (S_{target}), ~~means~~ <u>arrangement</u> for calculating a new optimal velocity [[(406)]], and [[means]] <u>an arrangement</u> for setting a new velocity during said scanning.

Claim 22.   (Currently Amended)   The arrangement of claim 21, wherein said <u>arrangement</u> ~~means~~ for receiving detected signals is a processing unit and said <u>arrangement</u> ~~means (804)~~ for controlling the detector replacement is a motor controller.

Claim 23.   (Original)   The arrangement of claim 21, wherein said displacement controller controls rotation of said detector having a rotation centre in said x-ray source.

Claim 24. (Currently Amended) An X-ray apparatus [[(100)]] of a photon counting type, comprising an x-ray source [[(101)]] and a displaceable detector ~~(105) being~~ arranged to move with a controllable speed across an image exposure area, characterised by an arrangement for counting the number of photons detected by the detector, said detector comprising an end arranged as leading edge in the displacement direction, ~~means (802)~~ <u>arrangement</u> for comparing the counted number of photons from a sensor in said end under a scanning movement with a pre-set value, and <u>arrangement</u> ~~means (803)~~ for controlling the speed of the detector displacement with

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respect to a result obtained from a signal from said sensor corresponding to a density of an object to be examined under said scanning movement.

Claim 25.   (Currently Amended)   A computer useable medium having a computer readable program code embodied therein to enable controlling exposure in an x-ray apparatus[[,]] when imaging an object, the apparatus comprising an x-ray source, a displaceable detector, the computer program code being arranged to control displacement of said detector array with a controllable speed across an image exposure area, the computer program code comprising: an instruction set for acquiring a signal relating to photons incident on an edge portion of the detector in the scanning direction under a scanning movement, an instruction set for comparing said acquired signal with a target value, and instruction set for controlling the speed of detector displacement with respect to the result of the comparison under said scanning movement.

Claim 26.   (Original)   A computer useable medium having computer readable program code embodied therein to enable controlling exposure in an x-ray apparatus, for imagining an object, the apparatus comprising an x-ray source and a displaceable detector being arranged to move with a controllable speed across an image exposure area, said code comprising: a first instruction set for acquiring a signal relating to photons incident on at least a part of the detector under a scanning movement, a second instruction set for comparing said acquired signal with a target value, and a third instruction set for controlling the speed of detector displacement with respect to the result of the comparison under said scanning movement.

Claim 27.   (Currently Amended)   A computer program for controlling exposure in an x-ray apparatus[[,]] when imaging an object, the apparatus comprising an x-ray source, a displaceable detector, the computer program being arranged to control displacement of said detector array with a controllable speed across an image exposure area, the computer program comprising: an instruction set for acquiring a signal relating to photons

incident on an edge portion of the detector in the scanning direction under said scanning movement, an instruction set for comparing said acquired signal with a target value, and instruction set for controlling the speed of detector displacement with respect to the result of the comparison under said scanning movement.